Final Technical Report
Grant NAGW-1717 to R.H. Waring
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The Oregon Transect Ecosystem Research (OTTER) project had the goal of testing an ecosystem model across a 200 km gradient in western Oregon where evergreen coniferous forests represent the full range in primary production in North America. At selected sites along the transect high quality meteorological stations were installed and data collected at hourly intervals to drive a computer simulation model (20) and to test a climatic model that extrapolates across mountainous topography (3).

Near each meteorological station one to three forest stands, a hectare or greater in size, were intensively studied to provide data on biomass, growth, litterfall, leaf-area index (21,22), and biochemical composition (2,13). These data served to test a variety of models driven in part or fully from remotely sensed data collected from aircraft and from satellites (5,6,10,15,24, 29).

In general, the ecosystem model proved robust and fairly accurate in estimating above-ground productivity, litterfall but errors in estimating precipitation, soil water storage and rooting depth caused problems on drier sites. Direct physiological measures of water stress proved more useful in parameterizing models. Remote sensing of seasonal changes in surface temperatures, cloud cover, and canopy greenness show promise in driving regional scale ecosystem models from space (5,28, 32).

As an outgrowth of the OTTER project ultralight aircraft proved a valuable platform for airborne environmental analyses (14). This has led to establishing a Center at Oregon State University to further training and applications (R.H. Waring, P.I.) . In additions, other NASA projects have been approved (B.J. Yoder, P.I.) and are pending (M. Unsworth, R. Waring, R. McCreight, T. Crawford, and D. Baldocchi) research to continue research across the Oregon transect.

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